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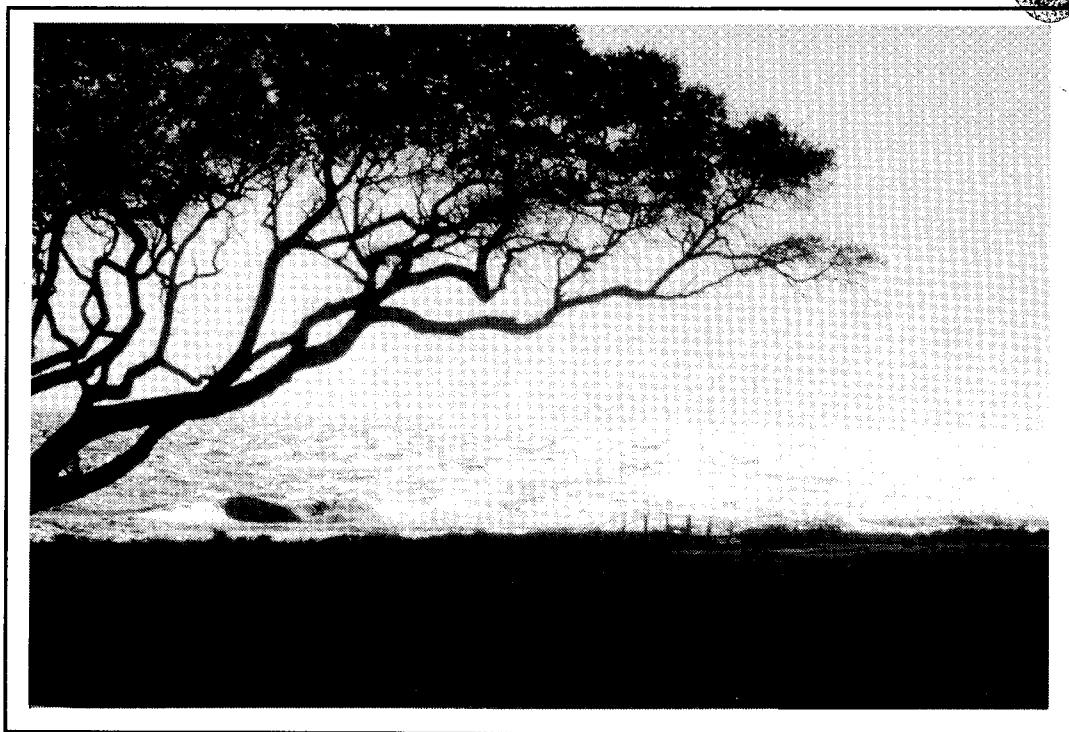
USACERL Special Report CRC-95/01
October 1994

A Case Study of Coordinated Resource Management Programs at Selected Department of Defense Installations

by
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The Legacy Resource Management Program, created after Congressional passage of the Defense Appropriations Act of 1991, requires a comprehensive, integrated resource management program for Department of Defense (DoD) installations and properties. To help meet the goals of the Legacy Program, researchers conducted an assessment of current resource programs. Objectives of this phase of the research were to (1) identify instances where natural resource and cultural resource programs have succeeded in coordinating management activities and (2) determine properties and processes that foster coordinated resource management. To meet these objectives, researchers conducted case

studies of seven exemplary installations/activities. The studies showed that understaffing, particularly for cultural resources management, is a universal problem; a qualified, committed staff is considered the most important factor in establishing and maintaining a successful resources program. Inadequate funding does not inhibit coordination and project review between cultural and natural resources staffs, but it has prevented many installations from developing complete resource inventories. Strong command support and accurate information from installation resource inventories were also identified as critical factors in successful resource management.

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave Blank)	2. REPORT DATE October 1994	3. REPORT TYPE AND DATES COVERED Final	
4. TITLE AND SUBTITLE A Case Study of Coordinated Resource Management Programs at Selected Department of Defense Installations		5. FUNDING NUMBERS MIPR E87910349	
6. AUTHOR(S) Bruce C. Dickson and Harold E. Balbach			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Construction Engineering Research Laboratories (USACERL) P.O. Box 9005 Champaign, IL 61826-9005		8. PERFORMING ORGANIZATION REPORT NUMBER SR CRC-95/01	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Office of the Assistant Chief of Staff for Installation Management (OACS[IM]) ATTN: DAIM-ED-N 600 Army, Pentagon, Washington, DC 20310-0600		10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES Copies are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.		12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The Legacy Resource Management Program, created after Congressional passage of the Defense Appropriations Act of 1991, requires a comprehensive, integrated resource management program for Department of Defense (DoD) installations and properties. To help meet the goals of the Legacy Program, researchers conducted an assessment of current resource programs. Objectives of this phase of the research were to (1) identify instances where natural resource and cultural resource programs have succeeded in coordinating management activities and (2) determine properties and processes that foster coordinated resource management. To meet these objectives, researchers conducted case studies of seven exemplary installations/activities. The studies showed that understaffing, particularly for cultural resources management, is a universal problem; a qualified, committed staff is considered the most important factor in establishing and maintaining a successful resources program. Inadequate funding does not inhibit coordination and project review between cultural and natural resources staffs, but it has prevented many installations from developing complete resource inventories. Strong command support and accurate information from installation resource inventories were also identified as critical factors in successful resource management.			
14. SUBJECT TERMS Legacy Resource Management Program natural resources--management Coordinated Resource Management Planning (CRMP)		15. NUMBER OF PAGES 38	16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT SAR

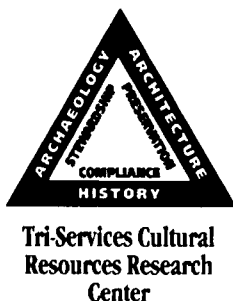
Foreword

This report was prepared for the U.S. Army Office of the Assistant Chief of Staff for Installation Management (OACS[IM]) with funding through the Legacy Resource Management Program under military interdepartmental purchase request E87910349, dated 29 April 1992, "Manual for Documenting Historic Military Structures." The technical monitor was Dr. Constance Ramirez, DAIM-ED-N.

This work was conducted through the Tri-Services Cultural Resources Research Center by the Environmental Natural Resources Division (EN) of the Environmental Sustainment Laboratory (EL), U.S. Army Construction Engineering Research Laboratories (USACERL). The principal investigator was Dr. Harold E. Balbach. Dr. William Severinghaus is Chief, CECER-EN, and Mr. William Goran is Chief, CECER-EL. The USACERL technical editor was Gloria J. Wienke, Information Management Office.

The following individuals are gratefully acknowledged for their contributions to this report: Steven Smith of the South Carolina Archaeological Institute, and the installation Resource Management staffs.

LTC David J. Rehbein is Commander and Acting Director, USACERL, and Dr. Michael J. O'Connor is Technical Director.



The Tri-Services Cultural Resources Research Center is a research and technical support center that assists the U.S. military services in the stewardship of cultural resources located within Department of Defense (DOD) installations or facilities. The Center, located at USACERL, helps installations manage their cultural resources and comply with Federal, State, and DOD preservation mandates.

Contents

SF 298	1
Foreword	2
1 Introduction	5
Background	5
Objective	6
Approach	7
History of Resource Management	8
2 Installation Survey	11
Staffing Questions	11
Project Review Questions	14
Funding Questions	15
Resource Inventory Questions	18
Physical Facilities Question	19
Command Support Question	19
Additional Observations	21
3 Coordinated Resource Management	22
CRMP - Coordinated Resource Management Planning	22
Lessons From Water Resources Management	24
The Large Scale Multi-Resource Management Experience	25
Superior Coordinated Resources Management: Exceptional Waters Fishery Management	25
Cultural Resources as Environmental Resources	28
Integration of Programs and Mission	28
4 Summary and Recommendations	30
Summary	30
Recommendations	31

References 34

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1 Introduction

Background

The Legacy Resource Management Program was created following Congressional passage of the Defense Appropriations Act of 1991.* The purpose of the program is to develop a comprehensive, integrated resource management program for Department of Defense (DoD) installations and properties (Public Law [PL] 101-511). To achieve the overall goal of the Legacy Program, the DoD needs to integrate resource management activities at two distinctly different functional levels: outside the DoD and within the DoD. The first level will require cooperative agreements and resource management plans for all DoD lands, facilities, and property in concert with outside public and private agencies (i.e., Bureau of Land Management [BLM], Soil Conservation Service [SCS], United States Forest Service [USFS], and The Nature Conservancy [TNC]). The second level, which constitutes the focus of this research, requires development and coordination of natural and cultural resources management programs at DoD installations. These programs need to be examined and modified, where necessary, to ensure the success of the long-term goal of the Legacy Program—development of an integrated stewardship program for both cultural and natural resources within DoD mission activities and the public interest.

To meet this second level of integration, an assessment of current resource programs needed to be conducted at DoD installations because quantitative information about the types and status of both cultural and natural resource management programs at installations was largely lacking at headquarters level. To rectify this situation, the Survey of Current Programs (SCP) Task Area was created to gather installation data and generate information to help develop an integrated stewardship program. New program development would depend on information about current DoD resource management operations and on identification of characteristics and factors that could be modified to promote better, integrated resource management. Discovering the extent and manner in which DoD resource management programs currently function required activities in a number of related initiatives.

*The *Legacy Resource Management Program Report to Congress*, September 1991, contains an in-depth description of the legislative purposes of the program.

The SCP contains five related initiatives to discover how Legacy-related resources are being managed at DoD facilities:

1. Conduct a DoD-wide survey consisting of an extensive set of questions for military installation natural and cultural resource personnel. The survey consisted of qualitative and quantitative questions about current programs and resources.
2. Conduct installation site visits to interview cultural and natural resource staff and gain a greater familiarity with Legacy-related resource programs throughout DoD. Personal interviews provided a means for evaluating resource awareness and characterizing management programs.
3. Evaluate resource management outside DoD to determine how other agencies manage both cultural and natural resources. Researchers assessed over 30 state and regional offices of various agencies by phone interviews or site visits to learn about their resource management programs.
4. Examine funding for Legacy-related resources programs was also examined to determine tracking and management of monetary resources being expended at installations for resource management activities.
5. Conduct a case study of exemplary programs to identify and evaluate successful cultural and natural resources programs within DoD.

The information generated from these activities will be used to characterize DoD resources and how they are managed with the goal of improving current programs and moving toward long-term stewardship. This research focused on initiative 5.

Objective

The objectives of initiative 5 are to (1) identify instances where natural resource and cultural resource programs have succeeded in coordinating management activities and (2) determine properties and processes that foster coordinated resource management. Tasks supporting these objectives include identifying the characteristics, mechanisms, and factors that prompt coordinated resource management and recognizing obstacles to integrated management at DoD facilities. Information from these exemplary programs and program managers can direct development of initiatives for coordinated in-house natural and cultural resource management programs at DoD installations, thereby helping to ensure the overall success of the Legacy Program.

Approach

The research goal was to be achieved by examining specific cases on DoD installations where successful resource management programs are operating. Researchers identified and investigated cases of superior coordination in cultural and natural resource management programs in all military services. These cases were nominated by the various Service Headquarters in Washington, DC, during March 1992, and represent many of the inherent differences in ecologically diverse geographic regions, military services, installation size, and missions/land uses at a variety of installations.

Ten exemplary programs were initially identified and contacted. Of those, seven provided sufficient information for evaluation: Vandenberg Air Force Base and San Clemente Island Naval Air Station in California, The Air Force Academy and Fort Carson in Colorado, F.E. Warren Air Force Base in Wyoming, Fort Polk in Louisiana, and the Atlantic Division Naval Facilities Engineering Command, Norfolk, Virginia. The latter is not an installation per se, but is a group of facilities managed jointly by an environmental and intergovernmental coordinator.

A brief set of questions on coordination of cultural and natural resource programs was developed after discussions and review of several preliminary studies concerning resources management in general and DoD experiences in particular. Areas of inquiry were eventually narrowed to six topics relative to cultural and natural resource management at military installations: staffing, project review, funding, resource inventories, physical facilities, and command support. The specific questions are presented below.

1. How well balanced, in relation to the installation's respective resources, are the numbers of professionally trained natural and cultural resource personnel at your installation?
2. Where are the personnel (staff) deficiencies (if any)?
3. Are these professionals and their activities and responsibilities respected by other installation personnel or are you often viewed as obstructionists?
4. When a prospective action has the potential to impact natural and/or cultural resources, is there a standard review process that includes both natural and cultural resources personnel, or is the review done independently?
5. Is the review process rigorous and part of a regular installation routine (i.e., a standard procedure)?

6. Does available funding foster the coordination of management activities between natural and cultural resources programs?
7. Does the current level of monetary resources meet the management needs of the respective resources at the installation?
8. Does the source of funding inhibit or constrain coordination activities?
9. Have complete resource inventories of both natural and cultural resources been carried out at the installation?
10. Are resource surveys periodically updated?
11. Are natural and cultural resource management personnel located in the same facility?
12. Does the command structure at the installation provide a framework that helps facilitate cooperation and coordination between natural and cultural resource management programs?

The resource program at each selected installation was assessed using the above questions by either a face-to-face or telephone interview with natural and cultural resource personnel. The brief survey did not concentrate on *either* natural or cultural resources but attempted to provide balanced coverage. Personnel at various levels and with different specialties (archaeologists, ecologists, program supervisors, and engineers) were interviewed to obtain different management program perspectives within the resource program hierarchy.

Following the formal questioning period, participants were given the opportunity to provide additional comments that *they* felt were important or relevant to coordinated resources management. The face-to-face interviews lasted about 1½ hours and telephone interviews took between 35 and 60 minutes. In addition, results from other Legacy supported activities and correlations with the literature were also considered in reaching the final conclusions.

History of Resource Management

In the not-too-distant past, resource management reflected John Stuart Mill's utilitarian ethic. Utilitarian theory holds that what is right is to act or bring about the greatest possible good consequences over bad consequences for all concerned (i.e., the

greatest net good).^{*} The adoption of this theory by economists (economic utilitarianism) eventually instilled in people the idea that resources *need* to be utilized because their *use* would generate the greatest net good. If resources were not used, they were considered wasted (Hargrove, 1989).

The early development of professional resource management unfortunately followed economic utilitarianism. An example of the application of the utilitarian ethic is exemplified in the development of forest resource management in the United States. Trees were "best utilized" when converted into fuel, paper, and building materials. Therefore, forest management took a form that put timber production first and foremost. Gifford Pinchot, the first Chief of the U.S. Forest Service, pointed out that conservation did not mean protection of resources but their wise and efficient use to serve the material interests of humankind (Nash, 1989). The forests were not, at that time, recognized for the ecosystem services they provided to humans and other organisms (biodiversity, watershed protection, recreation); they were merely a system that produced raw materials. However, the emergence of the ecological sciences brought knowledge concerning ecosystems and from that came a new perspective to resource management (Nash, 1989).

Resource management has moved from a historical focus on single use resources issues to a complex focus on multiple resource issues. Specific resources are now viewed, probably correctly, as parts of interdependent systems and the greatest net good (to both individuals and society) is not achieved by management of one resource at the expense of others. The evolution from singular resource management toward multiple resource management has been slow and has suffered numerous setbacks. An inadequate understanding of natural systems and strong emotional beliefs and preferences regarding human artifacts, endangered species, and other resources make integrated resource management difficult. Individual and agency biases and fragmentation of management efforts does not, as Stroup and Baden (1983) write, "promote the kind of resource management that leads to high social welfare."

Resource management issues throughout the United States affect Federal, state, and private organizations, and individuals. The policies and practices of resource management are increasingly more public. This public awareness was recently exemplified by the continuing debate over the fire policy in the Greater Yellowstone Ecosystem following the major burns of 1988. In Yellowstone Park, aspects of multiple resource management were severely criticized by both those inside and outside park management. Before this situation can be turned around and the Park and its

^{*}Good is defined as happiness, and happiness as pleasure. Utility, therefore, attempts to maximize happiness. When utilitarianism was embraced by economists, the result was often exploitation and domination of natural systems and the subsequent creation of material wealth (i.e., human happiness).

immediate surroundings be managed as an ecosystem, an ethical and institutional reorientation will be required (Goldstein, 1992).

Resource management issues also affect the DoD. DoD has extensive land holdings and over 1,000 installations in the United States and its possessions (Smith and Balbach, 1992). Differences in resource needs, like those found at DoD installations, often result in conflict within and among associated internal and external management agencies and user groups. These conflicts, when left unresolved, can impede or derail a comprehensive resource management plan. Conflicts need to be identified and resolved if multiple resource management programs are to succeed in their broadest sense.

2 Installation Survey

This chapter examines the results of an installation survey of exemplary programs. The specific survey questions are listed and additional problems and issues that were raised during the interviews are included. The results of each topical area are presented individually. In cases where there are multiple questions, each specific question is handled individually *and* in relation to the other questions within that subject area due to their interrelated nature. Lastly, research findings from literature sources relative to coordinated/integrated resource management are discussed.

Staffing Questions

1. *How well balanced, in relation to the installation's respective resources, are the numbers of professionally trained natural and cultural resource personnel at your installation?*
2. *Where are the personnel deficiencies (shortages)?*
3. *Are these professionals and their activities and responsibilities respected by other installation personnel or are you often viewed as obstructionists?*

Staffing at the exemplary installations is highly variable and depends on resources and mission requirements. Of the seven installations surveyed, five managers indicated their resource management staff was balanced in relation to the resources at their location. This does not mean that there are equal numbers of natural resources and cultural resources staff at these installations. In most cases natural resources personnel outnumber cultural resources personnel, often at a ratio of 6 to 1 or greater. The distribution of staff is skewed because some installations have vast resource bases (particularly those in the West), different missions have specific requirements, and the mission's degree of impact on cultural and natural resources varies among installations. At locations with large, diverse natural resources bases, the staff often manage timber, wildlife, fisheries, agricultural, and other resources. Some of these natural resource areas have been the focus of past management programs and remain installation priorities. Because of this previous status, natural resources management programs often contain more special programs and initiatives

and initiatives than cultural resources management programs.* The disproportionate number of natural resources personnel also reflects the fact that they often perform some collateral duties in cultural resources.**

Shortages in resource management staffing were identified in six of the cases assessed. Although both natural and cultural resource areas could use larger staffs, cultural resources is the area with the greatest need. Cultural resources staff shortages were particularly acute for archaeologists, even though many of the installations have large archaeological resources that need to be evaluated, cataloged, and managed.†

Natural resources staff often assume cultural resources duties and responsibilities even though they lack sufficient professional preparation or experience. One resource manager felt that while this filled a need in his staff, it had a negative effect in that the person was not available to work in his/her area of specialization. This was viewed as an inefficient use of human resources. Additionally, the need, and inability, to hire and maintain a highly specialized staff also presented problems. Because most resources staffs need additional personnel, the loss of a person due to funding cuts or other circumstances has the potential to create major functional difficulties in a resource management program. One respondent stated, "If we lose one person, we lose one function." This makes it readily apparent that many management programs are operating at a minimal level; they cannot undergo staff reductions and maintain their exemplary status.

To deal with staff shortages, installations use several programs to supplement the in-house staffs. Some installations rely on contractors to perform cultural resource assessments and compliance requirements when actions are proposed. Other installations use coordinated management agreements with agencies like the National Park Service. This type of arrangement is also used for natural resources management.

Three of the installations surveyed have extensive ongoing agreements with colleges and universities for resource assessments and special projects. Without the services of graduate students and academic professionals, many special projects would never be conducted. This situation was most often encountered within cultural resources for archaeological assessments and research projects and

*Smith and Balbach (1992) made similar observations following visits to military installations in 1991 and 1992. Their findings indicate that this situation is common and as they state "natural resource programs are somewhat entrenched in the installation hierarchy" (Smith and Balbach, 1992).

**Smith and Balbach (1992) also indicate that while natural resources personnel often have collateral duties and responsibilities in cultural resources, the reverse is relatively rare.

† Although Smith and Balbach (1992) found that cultural resources programs often are understaffed, they do not believe all installations need full-time cultural resources management personnel.

within natural resources for endangered species inventories, monitoring, and management.

Another area that can potentially affect the coordination and cooperation of natural and cultural resources staffs is that of professional respect. This is not a problem for most installations surveyed. But at times, cultural and natural resources staff were not taken seriously, were viewed as obstructionists, or were considered "a necessary evil."

The overwhelming attitude was that resources staffs provide an integral function in meeting the mission of the installation and are respected for their professional knowledge. Staff, both military and civilian, at these "successful" installations typically demonstrate a willingness to work through even difficult and complex problems and situations. The willingness and success have been identified as products of staff continuity (little turnover) and cooperation.

Attitudes also are influenced by other factors. Two installations reported that the command structure and the attitude of the commander help set the tone regarding how resource personnel are perceived. Another very successful program reflects the resource philosophy, management style, and personality of the person in charge of the resources program. (This is true of all these exemplary programs to a greater or lesser degree. The program manager is typically a strong personality with clearly stated opinions.) Managers must spend time in the field with military staff and "be willing to do battle with the people in green" if their programs are to succeed. Strong, balanced management results in effective, efficient resources staffs.

Other important staff-related components varied among installations. Many interviewees felt that the most qualified resource staffs were composed of generalists who could work on interdisciplinary teams. Others said that their best people were often lifelong local or regional residents who brought previous experience, special insights, and an understanding of resources that helped in their management activities. Most felt that professionalism, integrity, and especially commitment, were exceptional among their staffs.*

*Smith and Balbach (1992) and Schram, Dively, and Balbach (1992) made similar observations regarding resources management personnel within and outside the DoD.

Project Review Questions

4. *When a prospective action has the potential to impact natural and/or cultural resources, is there a standard review process that includes both natural and cultural resources personnel, or is the review done independently?*
5. *Is the review process rigorous and part of a regular routine (i.e., a standard procedure)?*

Coordination and cooperation between natural and cultural resources staffs for reviewing prospective installation actions that may have an impact on natural and/or cultural resources were identified as an important components of a successful management program. Six installations have a standard review process that includes both natural and cultural resources staffs. Most installation personnel also felt that their project review process was rigorous and followed a standard procedure. Differences emerged between services and installations regarding how the review process functions, where and when it is applied, the degree of formality, and the documentation that accompanies a review.

Generally, the review process for any action at these installations was similar to the National Environmental Policy Act (NEPA) review process. The NEPA framework provides the necessary structure and organization for reviews. Respondents indicated this approach was always used when it was legally mandated and their familiarity with the process naturally extended to actions of a lesser magnitude. Therefore, those surveyed felt they have a standard, rigorous review process that meets most needs. They believe this type of review process allows projects to move quickly from planning to completion with fewer delays.

For example, the Air Force has a formal review process with accompanying required documentation that is very effective. A resource specialist at one Air Force installation estimated that their process catches more than 95 percent of the actions with the potential to affect resources. Another installation, with a less developed resources management program, described their review as an "ad hoc process based on NEPA that is working but could be improved."

Other elements also contribute to the effectiveness of the review process at installations. The stage at which resources staff are included for consultation in the development of a proposed action was recognized as another very important factor for a successful review process. Early involvement by the resources staffs helps minimize delays and associated costs. In most instances the review process brings cultural and natural resources personnel in at an early stage, thereby facilitating project development and avoiding what is referred to by some resource

managers as "show stoppers." One supervisor stated that from his experience "it is best to bring staff [both cultural and natural resources] in on a project at the point where the project looks like it has a high probability of approval, but not too early because many projects never get approved; otherwise resources are wasted." This comment clearly shows that successful program managers are acutely aware of staffing constraints and funding limitations, and allocate both in a manner that maximizes their usefulness.

Lack of advance notice of actions and minor project alterations (including digging requests and maintenance and construction activities) were identified as the most frequent causes of project delays. One installation conducts weekly reviews of problem projects and monthly reviews of all projects to facilitate communication, environmental and cultural review, and ultimately project development and completion. Command personnel attend the monthly reviews.

The maturity of the resource management program and the availability of other resources (funding, staff) contribute to the quality of the review process for cultural and natural resources coordination. However, it should not be assumed that installations with small staffs and a lesser degree of formality associated with their review process are less capable or effective. Two respondents reported that the smallness of their staff contributed to their ability to review, recommend modifications, and finalize projects. They believe that small, cohesive staffs can assess most projects rapidly (less bureaucracy), have interdisciplinary professional expertise, staff responsibilities are known and tasked rapidly, and frequent informal staff contact increases communication and interaction.

Most resource specialists agreed that maintaining a formal process (environmental assessment [EA], environmental impact statement [EIS], National Historic Preservation Act [NHPA] §106) was necessary for large-scale projects or special problems. For small projects, however, many specialists believe a formal process unnecessary; the review could be best handled by including only specific resources personnel. Minor reviews often were done independently by either cultural or natural resources staff.

Funding Questions

6. *Does available funding foster the coordination of management activities between natural and cultural resources programs?*
7. *Does the current level of monetary resources meet the management needs of the respective resources at the installation?*

8. *Does the source of funding inhibit or restrain coordination activities?*

Inquires regarding funding brought the most varied and lengthy responses of any of the survey questions. All installations in the survey responded to question six by saying available funding *does not* inhibit coordination between natural and cultural resources.* In many instances funding for cultural and natural resources was separate; in other cases finances were shared. Program personnel related that competition for funds was rarely a problem and that cooperation between staffs facilitated allocating money for projects. One respondent said activities are coordinated because "our situation fosters unity as neither [resource program] gets enough funding." For major actions where cultural and natural resources impacts are expected to be substantial and for compliance projects, funds typically were available.** Allocations for smaller projects is not always as certain and may rely on command decisions, "fenced money,"† or year end money.

Question seven sought to determine if funding levels were viewed as adequate at these exemplary installations to meet the needs of the resources staffs. Survey results indicate that funding is a universal problem. No installation responded that they had sufficient funding to meet their management needs. As found in other survey areas, cultural resources suffers more from underfunding than natural resources. Money often flows where requests are most urgent (endangered species were often specifically cited). Another problem unique to cultural resources is that unlike some natural resource program areas (timber, agricultural outleases) cultural resources seldom generate income that can support activities and programs.††

But other factors were also noted. One respondent clearly stated that funding was never adequate because "we are always being asked, or need, to do more." Some installations reported that they could use their monetary resources more effectively if they had more staff, especially in cultural resources. Understaffing creates a situation that requires extensive contracting which, in some cases, is more expensive than it would have been for the project to be done in-house.

Study results also show that the source of funds usually has little influence on coordination between cultural and natural resources. Reasons for the lack of influence were related to the fact that both cultural and natural resources often seek alternative sources of funding for projects through interagency and university

*Schram, Diveley, and Balbach (1992) found that the same was true for resources programs outside the Department of Defense.

**Also observed by Smith and Balbach (1992).

† A formal or informal restriction on the purpose for which a fund allocation can be used.

†† Also found by Smith and Balbach (1992).

research agreements. Some natural resource programs generate substantial revenues that are used to support the programs. In many cases, surplus revenues go into general accounts, eventually reaching other programs. In one case, allocation and the routing of funds comes under the direction of one individual; funds are used as needed. This management approach precludes problems of coordination due to funding source.

Although researchers expected that funding would be viewed as a critical issue in the success of resource management programs, comments provided by managers and specialists went beyond those areas specifically addressed by the survey. Annual budgets showed considerable variation at the installations surveyed.* Some budgets were small, approximately \$150,000 for both cultural and natural resources combined, while others were more than \$2,000,000. It is interesting to note that many program supervisors and resource staff members stated that they would need to double their current budgets to further develop their resources program. The increase in funds would move their program from what they currently characterize as "only adequate" to "where it ought to be." The magnitude of this increase is serious and particularly important because it must be viewed in its proper context; this survey is only assessing what have been identified as *exemplary* resource management programs.

The budget increases do not need to be permanent in many cases. Several resource personnel indicated that they could achieve a level of operation with a temporary increase lasting a few years. Short term increases could allow resource programs "to get healthy" and "catch up with needs." New money could be devoted to special projects and to completing and updating both natural and cultural resources inventories (addressed in the following section).

Respondents also raised the issue of securing funds. Many noted that obtaining funds earmarked by DoD for cultural and natural resource management can be confusing and some programs compete with one another unnecessarily. They also pointed out that notification and information on how to get funds is often lacking.** In addition, a common complaint among the survey respondents stemmed from the fact that their personnel expend significant amounts of time and effort obtaining

*Specific budget questions were not asked in the survey or during the interviews. The information presented here was volunteered by resource staff members because they felt it was important for the purposes of this study, especially regarding the increasing of budgets.

**Finding money for installation programs was often described by resources staff as a terribly frustrating task. Piety and Balbach (1992) reports that tracking cultural resources and natural resources money is very difficult at installations as well. Accounting activities are not rigid and costs are rarely accounted for separately. Close monitoring is only found for certain special projects and programs (e.g., contracts, archaeological surveys, and endangered species following notice of violation [NOV]).

funds for their programs. This situation is expected and tolerated to some degree, after which it is seen as "lots of effort in nonproductive time to get money" and "an inefficient use of staff in an understaffed program."

Lastly, the interviews consistently showed that at most installations, staff members find creative ways to get funds, expand their programs, and stretch dollars. The use of volunteer organizations, cooperation with universities and outside agencies, and the completion of small projects developed within the context of other larger activities is common to all installations surveyed.

Resource Inventory Questions

9. *Have complete inventories of both natural and cultural resources been carried out at the installation?*
10. *Are resource surveys periodically updated?*

Survey results indicated that completed total inventories of both cultural and natural resources exist at only one of the installations examined.* This lack of completed inventories may seem unusual considering the exemplary status of the surveyed installations. However, the result is deceiving because it reflects an overall situation that can best be characterized as dynamic. Typically, complete inventories may exist for either cultural or natural resources but not both. Many of the installations had partial inventories, but the degree of completion and the level of detail varies widely. For example, one large installation had completed the natural resources inventories except for the forestry component and had more than 50 percent of the cultural resources inventoried.

Incomplete inventory status is a product of different circumstances and factors. Most installations had not completed inventories because of lack of both funds and staff. Many installation inventories reflected specific resource priorities. In situations where forest resources information was important for timber management and the generation of revenues, specific inventories were often complete and highly developed. This was achieved by channeling program generated revenues back into that particular resource management area. Other programs had different situations where wildlife, fisheries, wetlands, or endangered species were completely inventoried because of compliance requirements or recreational value.**

*This was achieved only through the continuing cooperation and aid of local academic institutions and volunteer efforts.

**Also noted by Smith and Balbach (1992).

Cultural resources often lagged behind natural resources in inventory completion with staffing and funding cited as the predominant factors. Although completed surveys of cultural resources were rare, cursory installation surveys serving to identify priority sites were common. Once a site was prioritized it was inventoried. All installation programs were involved in updating their resource surveys. This is an ongoing process that again depends on the availability of staff and finances.

All survey respondents indicated that completed inventories with periodic updates would allow them to manage installation resources properly and avoid problems of noncompliance. Comprehensive inventories would make it possible to shift the emphasis of the resources management program from one that is reactive to one that is proactive. In the words of one staff member, "it is very difficult to manage resources and avoid [compliance] violations when you don't know what you have."

Physical Facilities Question

11. *Are natural and cultural management personnel located in the same facilities?*

All but one installation reported that the natural and cultural resources staffs were housed in the same building or complex. It was common to have both staffs located in the same office.

In instances where cultural and natural resource staffs are located in the same building or office area, respondents indicated that both formal and informal communication was facilitated. They also strongly believe this arrangement is a fundamental requirement of an integrated resource management program. However, changes in installation organization often lead to fragmentation of staff and reduced contact between natural and cultural resources personnel. This was identified as disruptive to a program. Other respondents felt that if strong program management existed, staff communication and interaction were less of a problem even if they were physically separated.

Command Support Question

12. *Does the command structure at the installation provide a framework that helps facilitate cooperation and coordination between natural and cultural resource management programs?*

Command support was identified as another critical component of a successful resource management program.* Only one installation in the survey felt that command support was a problem for their management program. The staff believed command only noticed high visibility, priority issues that were often publicized. In this case, problems were most frequently encountered with midlevel command officers.

Cultural and natural resources staffs realize that the installation commander must be aware of their programs and view them as a necessary and positive facet of installation operations. Most situations reflect this attitude by command personnel and resources staffs acknowledge that command awareness is increasing. The integration of responsible resource management with other military activities is "part of doing business" and "required if the mission of the installation is to be maintained."

Frequent meetings and briefings keep command personnel informed of the activities and needs of the resources program at some installations. This approach promotes what is described as "a corporate decisionmaking process with a very open dialogue." Additionally, "command sensitization," as it is often termed, frequently serves to accentuate the positive benefits of cultural and natural resource programs.

Resource management staff often develop specific programs to educate and inform incoming commanders about installation cultural and natural resources. Educational brochures and installation tours for command personnel and their families are common. Two installations developed videos showing installation resources and current and past projects. Involvement and inclusion of command spouses is another successful method of exposing nonresource command level staff members to resources issues and programs.

Command involvement and the support of resources staff and programs has also been shown to create other, incidental benefits. Some individual managers stress that installation resources unique to local communities or regions can be a very positive part of community relations. Managers often showcase the unique resources and involve command personnel in this process. The result can be programs that provide valuable media exposure and attract outside resources that are then used in different management capacities on the installation (i.e., research projects, resource surveys and inventories, habitat restoration and manipulation). According to one staff member, a significant benefit of a resources program that has strong command support and involvement is that it can produce "media

*Also noted by Smith and Balbach (1992).

exposure that fosters positive public attitudes and perceptions, which in turn often avoids controversy and reduces watchdogging."

Additional Observations

The survey focused on specific areas identified as important to a successful natural and cultural resources management program. Discussions with personnel from both resource management areas often included topics that were not directly addressed in the survey but were influential in the success of the overall program. Two areas repeatedly emerged as crucial components for developing and maintaining a successful program. The first, and most critical, is staff related. The problems with understaffing have been discussed. It was also evident that program quality reflects the quality and commitment of the individual resources staff members and their willingness to work together. This cannot be overemphasized. Staff at the exemplary installations were doing much more than would normally be expected considering funding, lack of information, and other constraints.

The second area is personnel oriented, but is different from the first area because it is a function of how, *from a philosophical position*, management of natural and cultural resources programs are conducted, and how staff view their individual and collective contributions. Program personnel, one a manager and the other an active field person, at separate installations indicated that an encompassing resource philosophy must come from the top to prevent biased management of one resource over another. This management philosophy stresses that "there is no difference between cultural and natural resources; both are managed for their continued sustainable use." Adoption of this philosophy by both supervisors and field workers eliminates problems of coordination and cooperation because resources are no longer differentiated; the mission and installation are viewed from a new perspective that dictates that "all resources are essential to providing a healthy training environment, not just a training environment" and "utilization [military mission] depends on sustainable resources."

The ability of DoD resources staff to comply with Federal and state regulations regarding historic structures, archaeological sites, endangered species, and a host of other issues is due to their professionalism, performance, and commitment. Most are attempting, and see it as their goal, to go beyond compliance and move toward a proactive resource management program. One field resource staff member commented that his vision of the military base of the future was one that had a robust, fully-integrated resources program that could "create a military installation in a national park setting." While this may not be readily achievable at some installations it is at *least* a laudable goal.

3 Coordinated Resource Management

Coordination of management activities and management cooperation between multiple users, managers, and jurisdictions relative to resources management have been addressed extensively in the literature. Techniques and factors responsible for the success and failure of coordinated/cooperative resource management have been identified. The following sections contain information and insights into coordinated resource management found in other, non-DoD experiences.

CRMP - Coordinated Resource Management Planning

Anderson and Baum (1988) outlined a resource management process known as coordinated resource management planning (CRMP). CRMP originated in Oregon in the late 1940s and involved a group of ranchers and two Federal agencies. Since then it has been successfully applied to a variety of resource management concerns and continues to evolve. CRMP is defined as “a process by which natural resources owners, managers, and users, working together as a team, formulate the management of all major resources and ownerships within a specific area and/or resolve specific conflicts” (Anderson and Baum 1988). The goal is both the *process* and the *product* (management decisions and plans).

CRMP is designed to involve interdisciplinary resource teams, agencies, and users in interactive sessions that “develop the rationale upon which management decisions are based” (Anderson and Baum 1988). The process does not require any participant to “abrogate their authority and responsibility” because final decisions “are based on consensus, not voting” (Anderson and Baum 1988). Its applicability to resource management is useful because resource problems typically are not limited to “single ownerships, single resources, or single resource uses” (Anderson and Baum 1988). Overlapping resource problems and management challenges are commonly encountered on DoD installations.

Although a complete description of the CRMP protocol is beyond the scope of this discussion, many of the required components of CRMP can be found in the current operations of the installations surveyed in this study, including the need to have resource inventories, management flexibility, and planning groups. Furthermore, CRMP uses project prioritization and periodic reviews. Project prioritization

allows the interacting managers to realistically allocate time and resources. Periodic reviews define new problems, select additional priority projects, and document progress and accomplishments.

Anderson and Baum (1988) write that there is "no substitute for a sound ecologically-based resource inventory as the foundation for decisions aimed at meshing the management of all major resources in the planned area." They believe management flexibility is necessary because new information is always being developed and becomes available as the process proceeds. In addition, they think planning groups need to be kept as small as possible but must include proper representation and expertise and should function intact from the beginning of the CRMP process to its end.

At many of the DoD installations surveyed many of the CRMP components were evident and their importance acknowledged. Inventories were recognized as one of the most important components in developing a successful program. The ongoing nature of inventories and surveys at installations allowed flexibility in assessment and management. Small groups and continuity of resources staff were identified as important to management activity success as well.

The CRMP process uses the concept of resources management systems. These systems consist of a set of considerations or formats (practices, measures, other items) for each resource during the planning process. The formats are developed by experts and serve as guidelines for systematic discussion while formulating coordinated plans (Anderson and Baum 1988). Resource management system formats have been developed for a number of areas (fisheries, big game, endangered species, forestry, irrigated cropland).

Anderson (1991) has found that the CRMP process can be even more effective if the following areas are emphasized.

- The process should ensure that the management issue or proposed area is manageable for CRMP. If the area is too extensive and the issues too complex, planning and coordination become difficult. In these cases it is necessary to divide the project into manageable units.
- The team should be as small as possible but have proper representation and management expertise. It should also interact with other resource coalitions and working groups. Interaction provides more information and better communication, allows meetings to be run more effectively, and can reduce organizational difficulties.

- Use of preliminary checklists of topics and issues streamlines the planning process.
- Problems must be related to resource management, not land use.

While none of the exemplary programs surveyed follow the formal CRMP process (all have developed their own protocols), this type of system may be useful. In instances where resources programs are new, poorly developed, or ineffective, a CRMP process could provide structure and organization and its formats can guide resource management. Both the process, or the formats independent of the CRMP process, could be applied to reactive or proactive programs. CRMP formats may be particularly useful in situations where staff expertise is lacking by assisting in specific resources assessments and subsequent management.

Lessons From Water Resources Management

Water resources management (primarily issues of quantity and quality) has historically relied on cooperative, coordinated management approaches. Different management techniques are used and the level of interaction and organization varies. An example of successful management in Canada can be found in the Prairie Provinces Water Board (Alberta, Saskatchewan, Manitoba) (Barton 1985). Management problems in this case stemmed from the complexity of managing three rivers and not from jurisdictional issues, which is often the case. Management difficulties were overcome in part by cooperative research agreements and by creating a board that set ground rules for the group but left enough room for each province to manage their own water resources. This arrangement minimized intrusion into other jurisdictions. The cooperative management group, organized in 1969, developed a process that relies heavily on frequent informal contacts, regular meetings of committees, and a commitment to cooperate and formulate formal agreements.

Dorcey (1985) has also identified techniques for successful joint management of natural resources in Canada relative to water resources. Since the 1950s, management has moved from an *ad hoc* approach to a more formal process, which he feels is being driven by legislation. The processes discussed by Dorcey (1985) heavily rely on adopted guidelines, development of task forces for conflict resolution and planning, and the use of an Environmental Assessment and Review Process (EARP).^{*} Developing communications and bargaining skills, changing

^{*}EARP is roughly the equivalent of environmental assessments and environmental impact statements as required by NEPA.

attitudes and behavior, using expertise, leadership and accountability, planning, impact assessments, and mediation, are all acknowledged as important techniques for joint management (Dorcey 1985). All of these areas may not apply to military installations but many have been mentioned as important to DoD program success by respondents of the exemplary programs survey.

Weaknesses of joint/cooperative management and obstacles to successful resource management programs are also discussed by Dorcey (1985). Three areas are identified as serious: (1) weakness in data and information generated, (2) descriptive knowledge of the natural system may be good but functional knowledge is lacking, and (3) poorly developed planning and planning analysis. These areas can often be improved and, once addressed, have the potential to dramatically change resource management success.

The Large Scale Multi-Resource Management Experience

Goldstein (1992) identified management problems and potential solutions relative to the management of Yellowstone National Park and the Greater Yellowstone Ecosystem. Activity and interest from 28 political units in 3 states, 5 Federal agencies (National Park Service, United States Forest Service, United States Fish and Wildlife Service, Bureau of Land Management, and Bureau of Land Reclamation), private owners, and other interest groups have resulted in fragmented management efforts. Coordinated resource management is hampered by differences in legal mandates, institutional evolution, and bureaucratic rivalry.

Beyond these problems knowledge of ecosystem components is inadequate and the organizations lack a system to access the information that has been collected (Goldstein 1992). Joyce et al. (1990) also believe that successful multiresource programs require a classification and inventory system. Inventories again surface as a critical management component. When management is spread among different units, inventories must be available and accessible. Considering the cost requirements of inventories, restricted access to the information they generate is irresponsible. This points to the need to have interactive management groups that share *all* resource information and data.

Superior Coordinated Resources Management: Exceptional Waters Fishery Management

Coordination and cooperation in resources management is probably best exemplified by state programs for managing high value coldwater fisheries.

Investigations by Born et al. (1989, 1990) have examined state "exceptional waters" (EW) management programs. These resource management programs manage exceptional coldwater fisheries in 13 states and are rather extensive, ranging from a low of 12 miles in Oregon to roughly 12,000 miles in neighboring Idaho.

Because exceptional waters are especially valuable resources within a jurisdiction or a region, they often bring together several states and other governmental units. Although the tools for integrated fisheries management have been identified and have existed for some time, fragmentation and poor coordination of management programs have been long-standing problems. Surprisingly enough, how states identify, coordinate, and integrate management activities had not been analyzed before the work of Born et al. (1989, 1990).

The two Born studies assessed EW programs and found that the designation of EW is the first step in coordinated resources management.* As found in this case study of exemplary resource management at military installations, the EW research also showed that great variability existed between programs, and the knowledge of the participants was often limited regarding management tools and programs outside their immediate unit. This variability is not seen as detrimental because the flexibility of staff and the adaptability of management programs meets most resource management needs. However, it was emphasized that EW programs *must* be coordinated between traditional fishery management activities and related natural resources management programs (e.g., forestry, water quality, agriculture, mining, grazing) if they are to succeed. How coordination is achieved in EW programs depends on at least eight important mechanisms and their application in different management contexts (Table 1).

Another similarity between Born's study and this one was found in the attitude surrounding resource management. In EW cases, managing a particular resource was identified as only part of the management equation (Born et al. 1990). Other resources and the sociological aspects of resources management must also be understood and considered for programs to be successful. This is an essential component where public involvement is great (Born et al. 1990).

Born et al. (1990) also write "in most states we examined, there is substantial dispersion of the requisite authorities for sound management of these fisheries,

*The methods used by Born et al. (1990) were similar to those of this case study with the exception that this survey was done exclusively with personal and telephone interviews. Telephone interviews were part of a follow-up of a mail survey completed by individual fishery managers in the Born et al. research.

Table 1. Coordination mechanisms for EW management programs.

Coordination Mechanism	When Applied
Joint Planning	Frequently
Plan Review	Frequently
Formal Coordination Committees	Rarely
Informal Communication	Frequently
Memoranda of Understanding	Occasionally
Environmental Impact Review	Frequently
Cost-Sharing (acquisition, research)	Occasionally
Joint Staffing/Staff Sharing	Occasionally

surrounding watersheds, and the user community. This suggests the importance of coordinated, if not *fully integrated*, resources management."

Of the coordination mechanisms identified in Table 1, Born et al. (1990) highlighted four as very important: joint planning, plan review, environmental impact reviews, and informal communication. Informal communication was noted as the most critical coordination mechanism. (Informal communication was also noted by resource management personnel at the exemplary installations as being critical to coordinated management and, according to them, is best achieved by having natural and cultural resource staffs in the same office.) In addition, model EW programs had the following characteristics (Born et al. 1990).

- Data quality and analyses; in short, a program must practice "good science,"
- Continued monitoring and analysis for program adjustments,
- Reliance on professional judgement when valid, complete data is unavailable,
- Full support of administrative levels of agency,
- Endorsement by the scientific community (technical legitimacy and program stature) of the activities and methods,
- Aggressive public education/information,
- Close ties with potential support groups,
- Use of decisive, broad programmatic changes rather than incremental changes under some circumstances,

- Link programs, and
- Persistence.

Exceptional waters management programs reflect many of the same needs, problems, and management characteristics (both structural and functional) found at DoD installations. Accordingly, many of the factors attributed to EW program success were noted by those interviewed in this case study of exemplary programs. It is also worth noting that development of coordinated EW programs can be achieved within a reasonable timeframe. Montana and Pennsylvania were identified as having model state programs; the former was initiated in 1959 and the latter in 1983 (Born et al. 1990).

Cultural Resources as Environmental Resources

Neumann, Sanford, and Palmer (1992) feel that archaeological cultural resources are probably the most challenging management problem facing small staffs that lack specialized cultural resources personnel. The problem stems from the fact that the resources are often hidden and difficult to detect (subsurface) and that they have little practical value to the public. To overcome these difficulties, the researchers propose that archaeological cultural resources be managed like natural resources because of their inherent similarity. This similarity is reflected in both cultural and natural resources being part of a local *ecological system* which are pollutable (loss of integrity), potentially nonrenewable, and spatially predictable (Neumann, Sanford, and Palmer 1992). These characteristics allow archaeological cultural resources to be viewed like natural resources and managed accordingly. From a practical standpoint this view is readily understood, does not require special training of management personnel, and moves from site management to landscape analysis and management. This approach has been successfully applied to managing prehistoric cultural resources along the western shore of Chesapeake Bay, MD, and in Onondaga County, NY (Neumann, Sanford, and Palmer 1992). This management approach would be very useful where cultural resources programs are understaffed at DoD locations and could begin the process of integrating cultural and natural resources programs.

Integration of Programs and Mission

Resources management is moving toward integrated multiresource management. Based on analysis of the exemplary installation programs and review of the technical literature, resources programs are shifting from management activities

based on coordination and cooperation toward complete integration. It may be argued that integration generally refers to the same coordination and cooperation relationships, but this is not the case. Resources programs that cooperate/coordinate differ from those that are integrated. *Cooperate* is to act or work with another or others; *coordinate* is to bring into a common action, movement, or condition, or to act together in a smooth concerted way; *integrate* is to form into a whole or to end the segregation of and bring into common and equal membership in society or an organization. The major distinction is that cooperation and coordination bring different, often unequally represented, groups to act together temporarily. Integration forms a new group that has been developed from smaller units having *equal* membership and is not temporary.

Integration of cultural and natural resources management on military installations is not the last step in developing and maintaining a successful stewardship program. There must be a conscious effort to integrate the mission into the management program as well, but an integrated resources program must remain as the foundation of the overall management effort. Why? Because cultural and natural resource bases are, for the most part, fixed and therefore constrain certain types of activity. Military missions are everchanging and must be adapted to the resources. In essence, integration will need to develop through a phased process, moving from cooperation to coordination to partial integration to full integration as listed below.

- Phase I - Cooperation between natural and cultural resource programs.
- Phase II - Coordination between natural and cultural resource programs.
- Phase III - Integration of natural and cultural resource programs into a single resources program (i.e., envirocultural resources).
- Phase IV - Integration of military mission into a single resources program.

Most of the exemplary resource management programs assessed in this case study can be categorized somewhere between Phase II and Phase III; the programs are coordinated but not integrated. Other military installation resource management programs that are not exemplary are probably between Phase I and Phase II. It is important to recognize that cooperation and coordination have their place in resources management, but integration will continue to occur and may become the norm in the near future. The success of State EW programs and the management of archaeological cultural resources as environmental resources further verifies this trend toward integration.

4 Summary and Recommendations

Summary

This case study exemplary programs has identified characteristics, mechanisms, and factors that promote successful, coordinated resource management programs at DoD installations.

- The survey revealed that in most cases staffing at these “exemplary” installations is balanced in relation to the particular resource management needs, but most installations are understaffed, especially for cultural resources. Natural resources personnel outnumber cultural resources staff often at a ratio of 6 to 1 or greater. Qualified, committed staff are considered the most important factor in establishing and maintaining a successful resources program.
- All these installations have some form of project review process that includes both natural and cultural resource staff; the organization and format differs among services and installations. Generally, the review process encountered at these installations for any action follows a NEPA style format. Respondents indicated that this approach was always used when it was legally mandated and that their familiarity with the process was naturally extended to actions of a lesser nature.
- Funding does not inhibit coordination between natural and cultural resources at exemplary installations. In many instances funding for cultural and natural resources was separate; in other cases finances were shared. Adequate funding is a problem even at the exemplary installations. All respondents indicated they could upgrade their programs if they had a larger budget and could expand staff and complete inventories. A number of program supervisors and resource staff members stated that they would need to double their current budgets to further develop their resources program. However, the budget increases can be temporary in most cases.
- Survey results indicated that completed inventories of both cultural and natural resources exist at only one installation. Typically, complete

inventories may exist for either cultural or natural resources, but not both. Many of the installations had partial inventories, but the degree of completion and the level of detail varies widely, with cultural resources lagging behind natural resources. All installations were involved in updating the resource surveys. The information generated by inventories was viewed as critical to successful management.

- All but one installation reported that the natural and cultural resources staffs were housed in the same building or complex. It was common to have both staffs located in the same office. Resources staff also strongly believed this arrangement was a fundamental requirement of a coordinated resource management program, facilitating both formal and informal communication.
- Command support was identified as another critical component of a successful resource management program. Only one installation in the survey felt that weak command support was a problem for their management program. Cultural and natural resources staff realize that the installation commander must be aware of the programs and see them as a necessary and positive facet of installation operations. Command involvement and the support of resources staff and programs have also been shown to create other benefits and set the overall tone for the nature of the program.

Recommendations

If the goal of the Legacy Resource Management Program is to achieve an integrated stewardship program for natural, cultural, and earth resources within DoD, some aspects of the existing, single-goal programs will require modification. Changes, some of major proportions, will be required in the operational philosophies of some services, intermediate command levels, and certain individual installations. The changes will require a revised commitment from field staff, program supervisors, installation commanders, the military service hierarchy and the Office of the Secretary of Defense. The following recommendations are provided to assist in guiding existing policies and programs toward integration.

- A quality program is, as illustrated by these exemplary installations, only as good as the staff and, especially, the on-site program manager. The installations included in this nonrandom investigation were fortunate in having aggressive management leadership and dedicated supporting staff. However, substantial staffing increases, or a means to substitute for

needed staff, is necessary at even these exemplary installations. Each location must have an adequate number of qualified staff to carry out required management duties. Ideally, staff composition should reflect resource composition and magnitude. At exemplary installations, this appears to be a closer match than is the DOD-wide norm, so fewer unacceptable deviations appear. There is no standard formula that can be applied to determine how many natural and cultural resource personnel are needed at a location because too much diversity exists within DOD, but statements of need from the installation level should not be assumed to be typical complaining. The need for additional staff, or supporting contractors or other trained specialists, is very real and may be underestimated.

- Supervisors can only manage resources if they have the requisite information base to make decisions. Informed decisions require resource inventories and a system to deliver the information. The exemplary installations represent the upper level of current accomplishment in inventory completion and information management. This is one of the ways in which they are conspicuously different from the DoD norm. Inventories, data management systems, and the technical staff to develop and maintain them are costly. Specific budgets for this purpose are far from the norm within DoD. These needs, therefore, must become regularly programmed budget items directed toward expanding staff, carrying out inventories, and developing information management systems. These funds must not be allocated only at headquarters, but must be realistically available to installation natural and cultural resource management staff for programmed purposes and must be protected from diversion to other installation entities. Resources management programs cannot continue to operate from limited general operating funds nor can they depend on funds generated by their own program activities, which may be at odds with stewardship goals.
- Successful programs ultimately depend on command support. It is a characteristic of these highly successful programs that their managers have convinced a succession of local commanders that natural and cultural resources are important to the installation's military mission. The less successful program managers merely succeed in being allowed to coexist with the military mission. DoD-wide programs need to be developed to inculcate in all officers, and especially prospective commanders, the importance of cultural and natural resources management. This task cannot rest solely on the shoulders of resources personnel.

- If cultural and natural resources programs are to be brought together and placed under one umbrella as a means to ensure *integration* of programs, major changes will be required in many locations. These changes must occur in two complementary areas, the philosophical and the physical. A philosophical orientation that does not differentiate between natural and cultural resources will go a long way toward fully integrated management and pave the way toward sustainable systems management. It is also recommended that the two resources staffs be located in the same building and, where possible, share adjacent office areas. This survey of exemplary programs consistently found (confirming reports in the technical literature) that informal communication is *the* key to successful resources management and can only occur if both resources staffs have frequent contact.

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